

1998 INSECT REPORT

DIVISION OF PLANT INDUSTRY

INSECT CONTROL PROTECTS UTAH'S AGRICULTURE AND ENVIRONMENT



January 1, 1999

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The Division of Plant Industry**

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Introduction

Without control, damaging insects could cripple Utah's billion dollar a year agricultural industry. The success of Utah's food production industry depends upon effective control of harmful insects by producers and government agencies.

The Emergency Insect Program was initiated in 1985 with the enactment of the Insect Infestation Emergency Control Act (Chapter 35, Utah Code). The following information highlights the major insect programs conducted by The Utah Department of Agriculture and Food, Division of Plant Industry.

The Utah Department of Agriculture and Food, Division of Plant Industry is helping growers in the state to contain these and other agricultural and public nuisance pests by: (1) establishing insectories to rear natural predators for distribution; (2) trapping and monitoring insect movement, and (3) supporting research for better control methods.

We hope that you will find this publication informative with regards to the insects that threaten the quality and viability of Utah's agricultural enterprises and environment.

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AFRICAN HONEY BEE

Introduction

- ◆ The African honey bee (*Aphis mellifera scutellata*) was accidentally released in Brazil in 1956. Since then, it has migrated steadily northward.
- ◆ Within the last five years, the African honey bee has migrated into Arizona, Nevada, New Mexico, and Southern California. Based upon experiences in Mexico and Texas, the northward migration of the African Honey Bee cannot be stopped.
- ◆ Though usually smaller than the domestic honey bee, the African honey bee poses a serious threat to the beekeeping industry because its aggressive behavior will displace domestic honey bees and compete for resources. Utah's beekeeping industry produced \$1.2 million dollars of honey in 1997.
- ◆ The African honey bee represents a public health threat because it tends to sting more readily and in greater numbers than does the domestic honey bee.

Utah's African Honey Bee Program

- ◆ Rather than imposing additional regulations, the Utah Department of Agriculture and Food along with Utah's beekeeping industry proposes to approach the problem with surveys, early detection, and education of beekeepers and others involved with the program.
- ◆ The department has put into action a survey and detection program in the southern portion of the state consisting of 100 detection traps . There were no confirmed detections of African honey bees in Utah during 1998 from the program.

Action Plan for 1999

- ◆ The African honey bee is a serious threat to Utah's prodigious beekeeping industry, and is a public health threat. In 1999 UDAF plans to continue detection trapping of the African honey bee to determine if it has migrated into the state. UDAF will also continue to conduct education and outreach on issues concerning the African honey bee to the public and the beekeeping community.

APPLE MAGGOT AND CHERRY FRUIT FLY

Introduction

- ◆ The apple maggot (*Rhagoletis pomonella*), also known as the "railroad-worm", is a picture-wing fly native to North America. The cherry fruit fly (*Rhagoletis indifferens*) is blackish in color with tinges of yellow on the head and lateral margins of the thorax. Both insects have become a major pest of fruit trees in the U.S. and Canada.

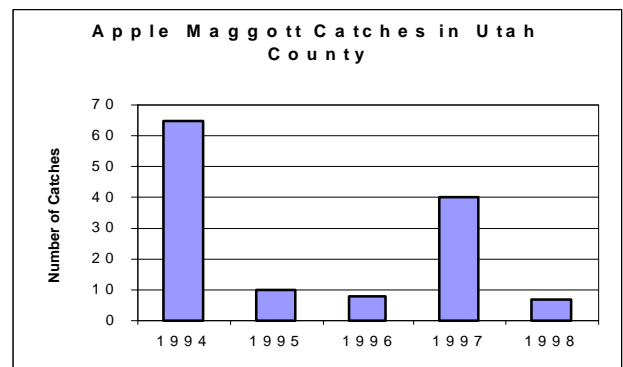


Adult apple maggot.

- ◆ Marketed fruit must be free from all apple maggot and cherry fruit fly injury. Therefore, thorough and effective control measures are necessary. There are more than 300 commercial fruit growers in Utah, with a commercial value of more than 27 million dollars annually. With Utah's apple maggot and cherry fruit fly program in place, fruit growers in Utah are able to export fruit to states that have quarantines. *All western states have apple maggot and cherry fruit fly quarantines.*

Utah's Apple Maggot and Cherry Fruit Fly Program

- ◆ The Apple Maggot Program was created in 1985 upon discovery of the apple maggot fly in Utah, it has subsequently amended to include cherry fruit fly detection and control. The program provides commercial grower with information that helps with better timing for insecticide spraying. Accurately timed sprays result in fewer insecticides being used with less harm to the environment and a lower production costs. Without proper control, these insects have the potential to affect all tree fruit grown in the state.



- ◆ UDAF employees monitor roughly 900 insect traps during the growing season. *No apple maggots or cherry fruit flies have been found in commercial orchards. All apple maggot catches in Utah county, shown in the above graph, have been in abandoned or non-commercial orchards.*

Action Plan for 1999

- ◆ UDAF will continue its vigorous detection trapping program in 1999, providing commercial fruit growers with vital information to prevent apple maggots and cherry fruit flies from spreading and affecting the quality and marketability of Utah's commercially grown fruit.

CEREAL LEAF BEETLE

Introduction

- ◆ The cereal leaf beetle (*Oulema melanopus*) is a small, metallic blue and red beetle. It originated in Europe, and was first identified in the U.S. in 1962.
- ◆ Both the larva and adult feed on the leaves of field crops, such as wheat and oats. The cereal leaf beetle has the potential to devastate crops, reducing harvests by up to 75%. For this reason, domestic grain markets require fumigation of grain or guaranteed insect-free shipments to prevent the spread of the cereal leaf beetle. *Many Western states have a quarantine in place for the cereal leaf beetle, including Arizona, California, and Nevada.*
- ◆ The insect has established populations in several Western states, including Idaho, Montana, Nevada, and Wyoming.
- ◆ Field crops represent Utah's greatest agricultural strength, with a 1997 total production worth \$314.9 million dollars.



Cereal leaf beetle.

Utah's Cereal Leaf Beetle Program

- ◆ The cereal leaf beetle was first identified in Utah in 1984. Now 17 of Utah's agricultural counties, including the nine northernmost counties, have cereal leaf beetle.
- ◆ The Utah Department of Agriculture and Food conducts an annual survey in cooperation with Utah State University to determine the range and density of the cereal leaf beetle population.
- ◆ A cooperative insectory program to produce predators of the cereal leaf beetle has been undertaken by UDAF, APHIS, and USU. Investigations of the effects of biological controls of cereal leaf beetles are under way in Cache and Davis counties. Initial results indicate that biological control has the potential to reduce the cereal leaf beetle population by 60%.

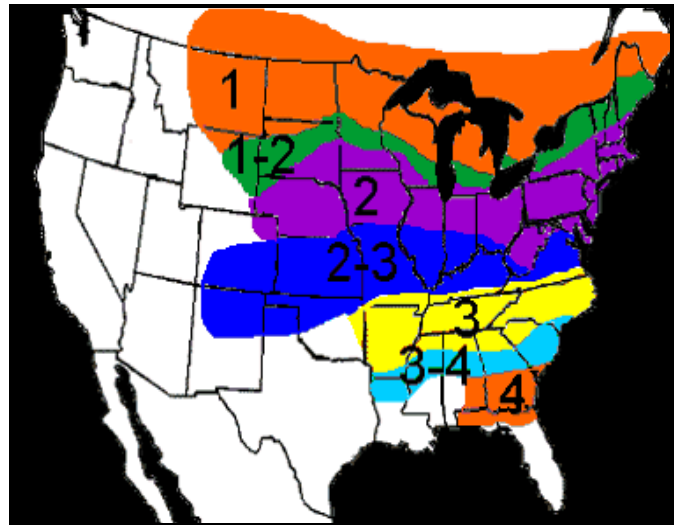
Action Plan for 1999

- ◆ The cereal leaf beetle presents a dangerous threat to Utah's agricultural industry. UDAF will continue its program of detection trapping of this quarantined insect. UDAF will also continue to provide funding and expertise to the cooperative insectory program to produce biological controls of the beetle.

EUROPEAN CORN BORER

Introduction

- ◆ The European corn borer (*Ostrinia nubilalis*) has become a serious threat to corn producers across the most of the Eastern U.S. and Southern Canada.
- ◆ The insect eventually becomes a moth, but it is the larval stage of the insect that damages corn and other crops. Sweet corn is the preferred host, but grain and silage corn can also be damaged. Over 200 other plants including cotton, sweet and hot peppers, beans, potatoes, tomatoes, oats, sugarbeets and large-stemmed flowers and weeds have been recorded as hosts.



This map shows the distribution of the European corn borer in the U.S. The numbers represent the number of generations of the insect in one year. (Dow Agrosiences)

Utah's European Corn Borer Program

- ◆ Utah has a quarantine (R68-10) in place for products that could harbor the European corn borer in order to keep this damaging insect from entering the state.
- ◆ A cooperative state and federal detection trapping program is in place in areas of concern for European corn borer. There were no detections of European corn borer during 1998.



European corn borer larvae.

Action Plan for 1999

- ◆ UDAF will continue its cooperative trapping program to detect the occurrence of European corn borer in the state. Detection information is vital to agricultural producers so that they may protect their crops from this devastating insect.

GRASSHOPPERS AND MORMON CRICKET

Introduction

- ◆ Mormon crickets and grasshoppers are significant pests in agricultural and range lands. These insects can damage crops and harass livestock.

Utah's Mormon Cricket and Grasshopper Program

- ◆ The Utah Department of Agriculture and Food in cooperation with other state and federal agencies, notably the U.S. Forest Service and USDA APHIS, conducts a program to control major infestations of grasshoppers and Mormon crickets throughout the state.
- ◆ In the 1998 survey, the cooperative program identified over a half million acres of lands infested with Mormon crickets in six counties (see map on next page). Indications are that Mormon cricket infestations may be increasing statewide in 1999.
- ◆ In the 1998 survey, the cooperative program identified over three hundred thousand acres infested with grasshoppers in fifteen counties (see map on next page).

Action Plan for 1999

- ◆ Mormon cricket and grasshopper infestations constitute a serious threat to Utah's agricultural and livestock industries. In 1999 UDAF plans to continue its cooperative program of identifying and suppressing large populations of grasshoppers and Mormon crickets.



Grasshoppers damaging corn.

GYPSY MOTH

Introduction

- ◆ Gypsy moths (*Lymantria dispar* L.) were accidentally introduced near Boston, Massachusetts in 1868 or 1869. In 1890 the first attempts by the to eradicate the gypsy moth began, with eradication and suppression activities continuing to this day.



Gypsy moth caterpillar.

- ◆ The caterpillar stage of the gypsy moth devours the leaves of more than five hundred species of forest and ornamental trees. Defoliation by gypsy moths can kill trees, affect a watershed's water quality through increased erosion, harm wildlife, and depress recreational activities. Hords of migrating caterpillars have been a major public nuisance in Eastern states.
- ◆ Since 1984, several Eastern states have spent an average of \$2 million annually to control and suppress gypsy moth populations.
- ◆ Utah could save up to \$30 million over the next twenty years by averting a serious gypsy moth infestation of the state.

Utah's Gypsy Moth Program

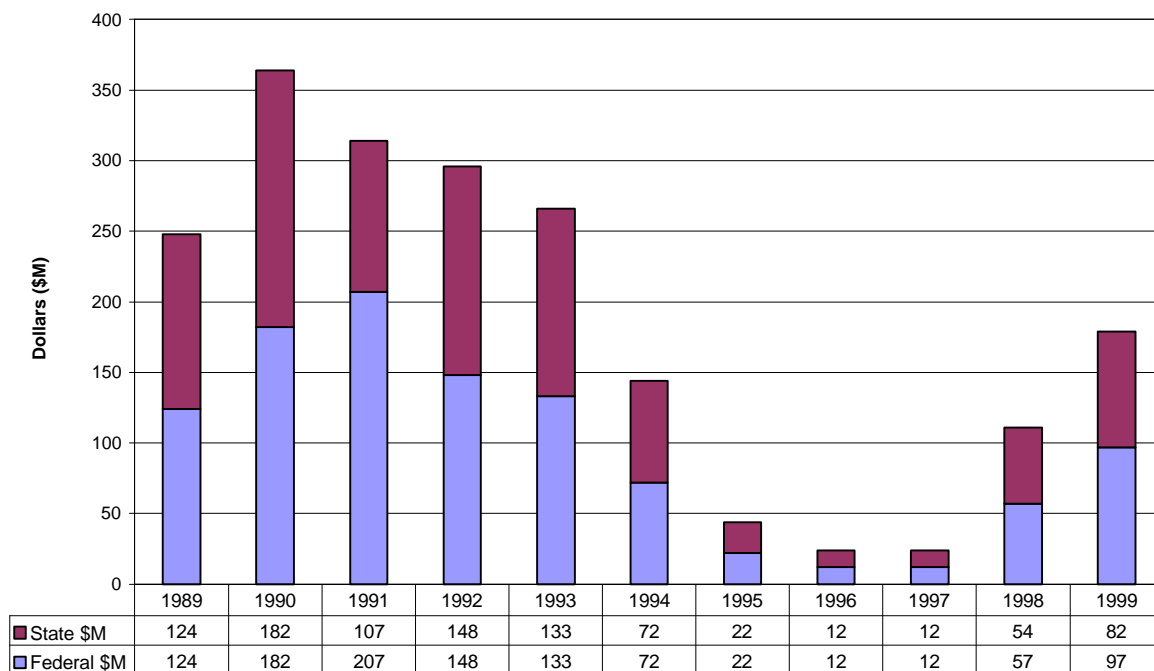
- ◆ Gypsy moths were first detected in 1988 in the Mt. Olympus Cove area of Salt Lake City. Smaller infestations have since been located in Davis and Utah counties.
- ◆ A combined state and federal survey and detection program has increased its number of gypsy moth traps from 516 in 1989 to 4,599 in 1998 to provide a better trapping network. However, moth catches have decreased from 2,274 in 1989 to 32 in 1998. This is evidence of the success of the program.
- ◆ Utah's arid climate, mountainous terrain, and lack of effective natural predators of gypsy moths gives the state a high potential for gypsy moth infestation and subsequent mass deforestation. Since Utah is not part of the contiguous range of gypsy moths in the Eastern U.S., a program of eradication rather than suppression of the insect is more cost effective and beneficial to the state in the long term.
- ◆ Eradication measures thus far have focused upon using the biological insecticide *Bacillus thuringiensis* (B.t.). B.t. is a naturally occurring soil bacteria that causes the gypsy moth larvae to become sick and eventually die. The insecticide has been used successfully in Utah since 1989, treating over 70,000 acres.

- ◆ In May 1998, 916 acres in two separate locations of Salt Lake County were sprayed with B.t. The spray program was initiated this year after 47 gypsy moths were detected in three locations in 1997, indicating a growing population.
- ◆ The cooperative gypsy moth eradication program includes: the Utah Department of Agriculture and Food's Division of Plant Industry, the USDA Forest Service, USDA-Animal Plant Health Inspection Service (APHIS), the Utah Department of Natural Resource's Division of Forestry, Fire and State Lands, Utah State University Extension Service, the Salt Lake City/County Health Department, as well as other agencies and local community councils.
- ◆ A quarantine has been established in Salt Lake county. A quarantine prevents new infestations by detecting new move-ins, and preventing movement from infested areas.

Action Plan for 1999

- ◆ With Utah's arid climate and potential to mass deforestation by gypsy moth larvae, the only solution is early detection and eradication of the insect. In 1999, the cooperative Gypsy Moth eradication program plans to increase its detection trapping network, and plans to treat approximately 900 acres in Salt Lake County to avert a potential growing population of gypsy moths. This graph shows the cost of the cooperative Gypsy Moth Eradication Program from 1989 to 1998, with 1999 estimated.

Utah Gypsy Moth Eradication History



JAPANESE BEETLE

Introduction

- ◆ The Japanese beetle (*Popillia japonica*) was first noticed in the U.S. around 1916 in New Jersey.
- ◆ Japanese beetles feed on hundreds of different kinds of plants, but severe damage occurs on plants and trees grown as ornamentals. In addition to feeding on tree leaves, feeding larvae can wreck commercially grown sod and urban lawns.
- ◆ The Japanese beetle can spread naturally and artificially over long distances by hitchhiking on infested plant material and transportation sources.
- ◆ Utah's nursery and floriculture industries had sales of \$23.8 million in 1997.



Japanese Beetle.

Utah's Japanese Beetle Program

- ◆ To help prevent the Japanese beetle from invading Utah by either natural or artificial means, the Utah Department of Agriculture and Food imposed a quarantine against this devastating insect (R68-15), effective January 4, 1993.
- ◆ The quarantine was enforced in the spring of 1998 when UDAF learned of shipments of nursery products from Oklahoma suspected of carrying Japanese beetles. The department is currently working with the nursery industry, both in Utah and out of state, to stop further unauthorized shipments.
- ◆ UDAF has also initiated a survey and detection program which uses pheromone traps to determine the presence of Japanese Beetles. UDAF placed over 100 traps in 1998, with no catches. Nurseries also placed traps, with no detections.

Action Plan for 1999

- ◆ The Japanese beetle is a serious threat to Utah's agricultural and nursery industries. In 1999 UDAF plans to continue its detection trapping program, and continue to enforce the quarantine to prevent a Japanese beetle infestation in Utah.

PLUM CURCULIO

Introduction

- ◆ The plum curculio (*Conotrachelus nenuphar*) is a dark brown and black weevil about 1/4 inch long with projections on the wing covers.
- ◆ In the larval stage of its growth, the plum curculio will feed inside of fruit for approximately 14 to 17 days, causing fruit to decay, and destroying the crop.

Utah's Plum Curculio Program

- ◆ The plum curculio was first discovered in 1983 in Box Elder County, and has at times infested the fruit producing areas of Box Elder County.
- ◆ Plum curculio is a quarantine pest. The quarantine has in the past prevented Box Elder county fruit growers from shipping fruit to some states.
- ◆ The Utah Department of Agriculture and Food conducts an annual survey of plum curculio to determine the range and population density of the insect. Surveys have been conducted since 1990.
- ◆ UDAF coordinates a control program with cooperation from USU Extension. Spray programs are conducted with property owners to control with the intent of eradicating the insect. Orchard clean-ups and tree removal programs help to eliminate insect habitat.
- ◆ In 1998, UDAF and USU Extension mailed several thousand brochures to residents of Box Elder county explaining the importance of identifying and controlling Plum curculio.



Plum Curculio.

Action Plan for 1999

- ◆ The result of a plum curculio infestation in Utah could include a substantial reduction in crop yields, loss of markets, domestic and foreign quarantines on tree fruits, increased pesticide use, and increased production costs.